

REMARKS

Favorable reconsideration and allowance of the claims of the present application, as amended herein, are respectfully requested. Applicants acknowledge, with thanks, the Examiner's indication in the Office Action dated November 17, 2003 that Claims 5-15, 24-28, and 30-32 are allowable over the art of record if amended to include all the limitations of the base claim. Although Claims 5-15, 24-28, and 30-32 have been indicated as allowable subject matter over the referenced prior art, applicants, at the present time, would like to obtain a patent including all the claims pending in the present application.

In the Office Action, the Examiner has indicated that U.S. Patent No. 5,656,182 to Marchman ("Marchman"), as disclosed by applicants' in the background of the invention section of the originally submitted specification, was not included in an information disclosure statement under 37 C.F.R. 1.98(b). In response, applicants submit an information disclosure statement including U.S. Patent No. 5,656,182 to Marchman and Japanese Laid-Open Publication No. JP 11-186132. Applicants note that Japanese Laid-Open Publication No. JP 11-186132 was discussed in the background of the invention section of the applicants' specification and therefore do not need to provide an English translation of the abstract. For the purposes of advancing prosecution, applicants submit a complete English language abstract for Japanese Laid-Open Publication No. JP 11-186132 for consideration by the Examiner.

Figures 1-14 stand objected to by the Draftsman under 37 C.F.R. §1.84 or §1.152 for minor informalities, such as copy machine marks, poor line quality and improper reference character format. Applicants respectfully defer submission of formal drawings until such time prosecution is closed on the merits. Figure 1 also stands objected by the Examiner for failing to be labeled as prior art. In response to the Examiner's comments and for the purposes of advancing prosecution, applicants' have labeled Figure 1 as "PRIOR ART". In light of the proposed correction to Figure 1, applicants respectfully request that this objection be removed.

Applicants have amended the detailed description of the drawings portion of the specification to be consistent with the proposed correction to Figure 1. Applicants have also made minor grammatical corrections to page 13, line 26, of the specification to recite "the present invention".

Claims 1-15 and 22-32 stand objected under 37 C.F.R. §1.75(a) for allegedly failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

Specifically, claims 1, 2, 23 and 29 stand objected for containing the term "said feature measurements" where proper antecedent basis requires the terms "said measurements of three dimensional feature changes". The appropriate correction has been made in the presently amended claims. Therefore, in light of the present amendments, the objection to claims 1, 2, 23 and 29 under 37 C.F.R. §1.75(a) has been obviated and applicants' respectfully request that the objection be removed.

Claim 3 stands objected to for reciting that measurements are "stored" yet allegedly fails to recite where the measurements are stored. In response to the Examiner's position and for the purposes of advancing prosecution, applicants' have amended claim 3 to recite that a computer stores the measurements of the three dimensional feature changes. Support for this amendment is found on page 13, lines 21 to 25, of the applicants' specification that describes a computer providing data collection and storage functions. Therefore, in light of the amendment to claim 3, applicants submit that the present objection of claim 3 under 37 C.F.R. §1.75(a) has been obviated and applicants' respectfully request that the objection be withdrawn.

Claim 6 stands objected to for grammatical errors for reciting, "computing a derived an equation". Applicants have amended Claim 6 to delete "an". Applicants respectfully submit that the objection to claim 6 has been obviated in light of the present amendment and respectfully submit that the objection be withdrawn.

Claim 7 stands objected to for allegedly lacking clear antecedent basis for the terms "said function". Applicants' note that claim 7 is ultimately dependent on base claim 1. Claim 1 includes the limitation of "a function", which defines a relationship between the feature measurements and the focus of the photolithographic exposure tool. Therefore, claim 1 provides antecedent basis for the terms "said function" recited in claim 7. Applicants respectfully request the objection of claim 7 under 37 C.F.R. §1.75(a) has been obviated and applicants' respectfully request that the objection be withdrawn.

Claim 9 stands objected to for reciting "said three dimensional feature type", where the antecedent basis is allegedly "a specific three dimensional feature type". Claim 9 has been amended to recite "said specific three dimensional feature type" and has also been amended to provide a period at the conclusion of the claim. Therefore, in light of the amendment to claim 9, applicants submit that the present objection of claim 9 under 37 C.F.R. §1.75(a) has been obviated and applicants' respectfully request that the objection be withdrawn.

Claim 11 stands objected to for reciting "said feature type" where the proper basis is allegedly "a specific three dimensional feature type". Claim 11 has been amended to recite "said specific three dimensional feature type". Therefore, in light of the current amendments, the present objection of claim 11 under 37 C.F.R. §1.75(a) has been obviated and applicants' respectfully request that the objection be withdrawn.

Claim 15 stands objected to for allegedly failing to define "A" and "B" in the equations " $6Ax + 2B = 0$ " and " $x = -1/3*(B/A)$ ". In response to the Examiner's comments and for the purposes of advancing prosecution applicants have amended claim 15 to recite "wherein A and B are empirically derived coefficients". Support for this amendment can be found in originally submitted Claim 14. Therefore, in light of the current amendments, applicants respectfully submit that the present objection of claim 15 under 37 C.F.R. 1.75(a) has been obviated and applicants' respectfully request that the objection be withdrawn.

Claim 24 stands objected to for reciting "said edge width versus focus data" which allegedly should recite "said edge width versus focus data point". For the purposes of advancing prosecution claim 24 has been amended with the appropriate correction. In light of the current amendment to claim 24, applicants' respectfully request that the objection be withdrawn.

Claim 28 stands objected to for reciting parts a), b), and c), which are previously recited in claim 22. Applicants have amended claim 28 to now recite parts d), e), and f). In light of the current amendment to claim 28, applicants' respectfully request that the objection be withdrawn.

Claim 29 stands objected to for allegedly not clearly defining how the functionality of the program code is being realized. In response to the Examiner's comments and for the purposes of advancing prosecution, applicants have amended claim 29 to recite that the computer program code is "executable by a computer". Support for this amendment is found throughout the specification; i.e., Page 13, lines 21-25. Therefore, in light of the current amendments, applicants respectfully submit that the present objection of claim 29 under 37 C.F.R. §1.75(a) has been obviated and applicants' respectfully request that the objection be withdrawn.

Claims 30 stands objected to for reciting the terms "fifth computer program code", which should recite "fifth computer readable program code". For the purposes of advancing prosecution claim 30 has been amended with the appropriate correction. In light of the current amendment to claim 30, applicants' respectfully request that the objection be withdrawn.

Claims 31, similar to claim 30, stands objected to for reciting the terms "sixth computer program code" which should recite "sixth computer readable program code". For the purposes of advancing prosecution, claim 31 has been amended with the appropriate correction. In light of the current amendment to claim 31, applicants' respectfully request that the objection be withdrawn.

Claim 32 stands objected to for allegedly failing to define the terms "X and Y". Although it is the applicants' belief that Claim 32 as originally submitted clearly and positively recites an aspect of the applicants' invention, applicants have amended claim 32 for the purposes of advancing prosecution. Claim 32 has been amended to recite where "x" and "y" are the "x-axis" and "y-axis" tilt values used to control tilt errors of the photolithographic exposure tool. Support for this amendment is found on page 13, lines 25-33, and page 14, lines 1-5, of the specification. In light of the current amendments, applicants respectfully submit that the present rejection of claim 15 under 37 C.F.R. §1.75(a) has been obviated and applicants' respectfully request that the objection be withdrawn.

Claims 1-4, 22, 23 and 29 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 5,976,740 to Ausschnitt, et al.

Before addressing the specific grounds of the prior art rejection under 35 U.S.C. §102(b), applicants have amended Claims 1 and 22. Claim 1 has been amended to recite that the method of controlling the focus errors of a photolithographic exposure tool comprises the steps of making measurements of three dimensional feature changes in a photosensitive resist, wherein the measurements include edge width measurements. Similar to claim 1, claim 22 has been amended to recite that a method of controlling focus errors comprises measuring three dimensional feature changes through a plurality of edge width measurements of a photosensitive resist. Support for these amendments are found throughout the present specification. See, for example, claim 9, page 5, lines 6-10, page 10, lines 7-12, page 10, line 31- page 11, line 7, page 11, lines 13-27, page 12, line 29- page 12, line 6. Specifically, referring to page 11, lines 18-22, a focus exposure wafer is created under varying focus and exposure conditions across the wafer, where edge width is measured for each focus/exposure condition or variant. Since the above amendments to claims 1 and 22 do not introduce any new matter into the application, entry thereof is respectfully requested.

Claims 1-4, 22, 23 and 29 stand rejected under 35 U.S.C. §102(b), as allegedly anticipated by Ausschnitt, et al. It is axiomatic that anticipation under §102 requires the prior art reference to disclose every element to which it is applied. *In re King*, 801 F.2d 1324, 1326, 231 USPQ 36, 138 (Fed Cir, 1986). Thus, there must be no differences between the subject matter of the claim and the disclosure of the prior art reference. Stated another way, the reference must contain within its four corners adequate direction to practice the invention as claimed. The corollary of the rule is equally applicable: absence from the applied reference of any claimed element negates anticipation. *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

Applicants submit that the applied reference, Ausschnitt, et al., fails to anticipate the applicants' claimed method since the reference fails to disclose each and every element of the applicants' claimed invention. See *In re King*, 801 F.2d 1324, 1326, 231 USPQ 36, 138 (Fed Cir, 1986). Applicants disclose a method of controlling the focus errors of a photolithographic exposure tool comprising the steps of making measurements of three dimensional feature changes in a photosensitive resist, *wherein the measurements include edge width measurements*; generating a function which defines a relationship between the feature measurements and the focus of the photolithographic exposure tool; and computing from the function a best profile focus value wherein the best profile focus value is used for controlling the focus errors of the photolithographic exposure tool. Applicants further disclose that the measurements of three dimensional feature changes in the photosensitive resist are three dimensional *profile* measurements of the design features. See Page 9, lines 5-10. The three dimensional profile measurements represent the sidewall angle of the photosensitive resist in the Z-axis. The sidewall angle is determined by measuring *at least the edge line width of design features*.

Referring first to the rejections of claims 1-4, 22 and 23, applicants submit that Ausschnitt, et al. fail to anticipate applicants' claimed method of controlling the focus errors of a photolithographic exposure tool, since Ausschnitt, et al. fail to disclose making measurements of three dimensional feature changes in a photosensitive resist, *wherein the measurements include edge line width measurements*. Applicants note that the

Examiner has admitted on Page 6 of the present Office Action that the prior art fails to disclose edge line width data points. Ausschnitt, et al. measure the length and width of photoresist features, where the focus or exposure dose parameters are determined by a mathematical function of the width or length dimensions of the photoresist features. See Column 4, lines 21-29. The mathematical function disclosed in Ausschnitt, et al. is dependent on photoresist measurements in the x-axis and y-axis (length v. width). Ausschnitt, et al. do not make measurements of the feature changes in the z-axis. Applicants' method determines changes in the sidewall angle of the photoresist features in the z-axis through edge width measurements. Ausschnitt, et al. fail to disclose measuring changes in the edge width. Therefore, since Ausschnitt, et al. fail to disclose making measurements of three dimensional feature changes in a photosensitive resist, *wherein the measurements include edge line width measurements*, Ausschnitt, et al. fail to disclose every limitation of the applicants' claimed method, as recited in amended claims 1 and 22.

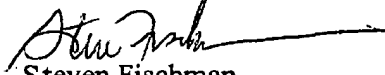
Turning to the rejection of claim 29, Ausschnitt, et al. fail to anticipate applicants' claimed method of controlling the focus errors of a photolithographic exposure tool, since Ausschnitt, et al. fail to disclose making *measurements of three dimensional profile changes in a photosensitive resist*. As discussed above, the method disclosed in Ausschnitt, et al. for determining focus and exposure parameters is dependent on photoresist measurements in the x-axis and y-axis (length v. width) of a photoresist feature and is independent of the z-axis. Applicants' method determines changes in the sidewall angle of the photoresist *profile* in the z-axis through edge width measurements. Therefore, since Ausschnitt, et al. do not make measurements of three dimensional profile changes in photosensitive resist, Ausschnitt, et al. fail to disclose every limitation of the applicants' claimed method, as recited in Claim 29.

The forgoing remarks clearly demonstrate that the applied reference does not teach each and every aspect of the claimed invention as required by *King* and *Kloster Speedsteel; et. al.*, therefore the claims of the present application are not anticipated by

the disclosure of Ausschnitt, et al. Applicants respectfully submit that the instant §102 rejections has been obviated and withdrawal thereof is respectfully requested.

Thus, in view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,


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Enclosures: (Fig 1 replacement sheet)